The Impact of Internet Finance on Household Risk Asset Allocation-Mechanism Analysis

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Abstract. Chinese households primarily rely on savings as the main component of their assets, yet the returns are distressingly low. Additionally, Chinese residents encounter challenges when it comes to preserving their wealth, as they have limited investment opportunities and face other obstacles. Nevertheless, the emergence of Internet finance, driven by the development of network information technology, has brought about substantial changes in how we produce, consume, make payments, and manage our investments and finances. This paper aims to explore the potential impact of Internet finance on residents' financial investment by conducting a comprehensive analysis.To achieve this objective, I employ a sample from the 2017 CHFS household financial survey data. The results reveal that the utilization of computers increases the proportion of households' allocation of financial assets. Furthermore, regardless of the inclusion of control variables, the regression coefficients are significant. This result suggests that a higher proportion of mobile payment usage is associated with an increased allocation of financial assets by households.These outcomes offer valuable insights for policymakers to introduce effective measures promoting rational household investment, optimizing the allocation of residents' investments, stimulating overall social investment, and refining the management of residents' investment portfolios and risk control. By addressing these challenges, we can strive towards improving the financial well-being of Chinese households.

1   Introduction

With the continued advancements in China's reform and opening up, there has been a significant increase in the disposable income of urban and rural residents. As of June 2020, the number of Chinese internet users reached 940 million, with an internet penetration rate of 67%. Furthermore, the number of online payment users reached 805 million, accounting for 85.7% of the total population. This rapid growth in internet finance has revolutionized the way residents invest and has provided convenient and diverse financial services and products.

The advent of internet finance has brought about numerous benefits, including improved efficiency in resource allocation and reduced transaction costs, thereby spurring economic growth. Within the realm of microfinance, household financial decision-making plays a pivotal role, with household investment serving as a key component. However, there is a relative dearth of research on the impact of internet finance on residents' financial investment, with most existing studies focusing mainly on the internal factors influencing household asset allocation.

Against this backdrop, this paper aims to examine the influence of internet finance on residents' financial investment and provide valuable insights for policy development in promoting rational household investment, optimizing residents' investment allocation, stimulating overall social investment, and refining portfolio management and risk control. By analyzing the potential impact mechanism, this research provides empirical evidence on the relationship between internet finance, mobile payment, and financial investment.

The findings of this study have multiple implications. Firstly, they can serve as a guide for encouraging residents to actively participate in the financial market, adjust their financial asset allocation, and enhance investment returns. Secondly, they offer suggestions to internet finance and traditional financial enterprises to develop financial products that cater to the unique needs of different residents, ensuring diversification and customization. Lastly, the study underscores the importance of recognizing and prioritizing internet finance by relevant authorities.

The remainder of this paper is structured as follows. The second section provides a comprehensive literature review, drawing upon the information search theory and

financial intermediary theory to understand the impact of internet technology on asset allocation. Based on these theories, hypotheses are formulated to guide the empirical analysis. The third section presents the empirical analysis, including the regression model, data description, and discussion of empirical results. Finally, the conclusion summarizes the key findings and suggests avenues for future research.

2   Literature Review and Research Hypothesis

In this part, the paper combs the relevant literature and its theoretical analysis from the information search theory, financial intermediation theory and combs the literature from further dimensions based on the literature and related analysis, after which the paper puts forward the research hypothesis.

2.1   Information Search Theory

The early search theory discussed the influencing factors of search behavior. Stigler (1961) pointed out that the broad perspective was due to the 'search front' caused by incomplete information. In the narrow sense, it is because of 'price dispersion', which means that there is an imbalance in the distribution of information acquisition and application between the two parties of the transaction, resulting in a large difference in the prices of the same products in the same region, and the degree of price dispersion is considerably affected by the search cost.   Internet information search helps to improve the problem of high search costs and serious information distortions in traditional markets.   The rapid development of Internet information technology has led to a rapid increase in the amount of information in Internet channels, and the resulting 'information noise' will gradually increase. Some current Internet technologies provide Internet users with customized information search methods such as' portrayal needs' and 'recommendation preferences', which significantly reduces search costs.   From the perspective of household financial asset allocation, this transaction model provides conditions for 'personal customization' and 'personalized solutions' of financial products and services in future Internet channels (Wang Wei and Zheng Yangyang, 2015).   On the whole, the use of the Internet will increase the family 's understanding of financial assets, reduce information uncertainty, and then promote the family' s allocation of financial assets.

2.2   Theory of Financial Medium

Financial intermediary theory is mainly divided into asymmetric information theory based on information economics and transaction cost theory based on transaction cost economics.   The 'functional theory' proposed by Merton & Bodie emphasizes that financial intermediaries have relatively stable functions, but their form and structure are not determined, and will be affected by numerous factors, such as macro market environment, technological innovation and upgrading, and market competition.   At present, there are several types of Internet financial intermediaries in the market: (1) Payment intermediaries. (2) Information intermediary. (3) Credit intermediary.   In recent years, traditional financial intermediaries have begun to innovate and improve traditional functions, from a simple 'agent' role to a practitioner and innovator of market participation and service provision. The popularity of Internet technology has accelerated this development process. Financial services based on the Internet have gradually covered the financial needs of most households, considerably improving the operational efficiency of financial markets.   The theory of financial intermediation provides a strong theoretical explanation in terms of Internet use to enhance household financial accessibility and promote household financial market participation, and also provides theoretical support for this study to explore the optimization path of household financial asset allocation.

2.3   Other Angles

Xie Ping et al. (2015) discussed the theoretical pillars, core characteristics, and policy implications of Internet finance.   Zhang Yingxin et al. (2019) put forward policy recommendations on Internet financial risk management.   Shi Yunyu et al. (2018) analyzed and summarized the characteristics and future development trends of Internet financial products.   In addition, with the shift of age structure, people's choice of assets and household asset allocation will also alter (Bakshi et al., 1994; blommestein, 2001; Davis, 2002).   Wu Weixing et al. (2007) found that the proportion of Chinese residents holding risky assets is not significantly affected by age, and the life cycle effect is not obvious.   Xia Miao et al. (2011) believed that the interaction between financial institutions and residents' preference for financial instruments will eventually lead to the shift of China 's financial structure.

Based on the above literature and theoretical analysis, this paper proposes the following research hypotheses:

Hypothesis 1 : The use of the Internet such as computer payment will increase the proportion of household financial asset allocation.

Hypothesis 2 : The increase in the proportion of Internet use such as mobile payment will increase the proportion of household financial asset allocation.

3   Empirical Analysis

3.1   Model Which Illustrates

$$y_{it} = \alpha_0 + \sum_{k=1}^{n} \beta_k x_{kit} + u_{it} \tag{1}$$

Based on formula (1), this paper makes OLS regression analysis. Among them, it is whether the family I has a stock account (StockFlag), the proportion of stock assets (StockMktR) and the proportion of financial assets (FinAssetR) in t (2017) ; is the intercept term, constant;   as independent variables, including computer payment (payComputer) and mobile payment ratio (payMobileRatio), the control variables are age (age), gender (gender) and education level (edu) ; is the interference term.

3.2   Variable Declaration

The calculation and explanation of the variables used in this paper are shown in Table 1.

Table 1. Description of variables.

Variables	Symbol（paper contents）	Definition
Explained variables: the proportion and number of risk assets (stocks, funds + derivatives)	StockFlag	Whether there is a stock account or not, 1 for yes and 0 for no
	StockMktR	Stock holding market value/total assets
	FinAssetR	Total financial assets/total assets
	StockMkt	The market value of stock holdings

| Explanatory variables: Internet platform use (Internet, mobile payment)	payComputer	Smart phones, computers and other Internet devices: 1 yes, 0 no
Family characteristics and personal characteristics	payMobileRatio	The proportion of mobile payment, 1 represents no use, 2 represents the use range within 0-20% ; 3 represents the use ratio of 20% -50 % ; 4 represents 50% -80 %, 5 represents more than 80%.
	hhid	Family id
	pline	Members id, 1 person, 2 spouses or partners, 3 parents, 4 parents-in-law/parents-in-law, 5 grandparents/maternal grandparents, 6 children, 7 daughters-in-law/son-in-law, 8 grandchildren/granddaughter, 9 granddaughter-in-law/grandson-in-law, 10 siblings, 7777 others
	Age	Age, 1 is 16 years old, otherwise 2
	edu	Educational level, 1 No schooling, 2 Primary school, 3 Junior high school, 4 Senior high school, 5 Technical secondary school/Vocational high school, 6 College/Vocational high school, 7 University undergraduate, 8 Master 's degree, 9 Doctor' s degree
	gender	Sex, 1 male, 2 female

Note: The total household assets calculated by CHFS2017 include financial assets and non-financial assets, and financial assets include a social security account balance, deposits, cash, stocks, funds, financial management, bonds, derivatives, non-renminbi capital Property, gold, other financial assets, loans;   non-financial assets include agricultural assets, industrial and commercial assets, housing. Housing assets, shop assets, land assets, vehicle assets, and other non-financial assets.

3.3   Data Description and Descriptive Statistics
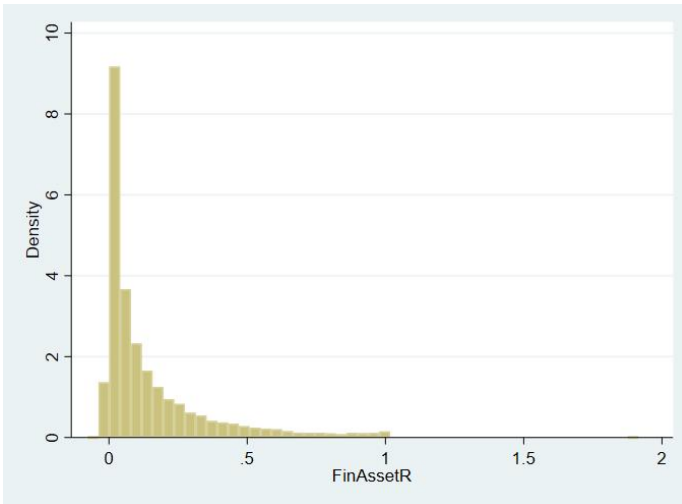
Fig. 1. Proportional distribution of financial assets.

The data in this paper are from the CHFS2017 household financial survey data. After data processing, the study sample contains 127012 data. First of all, this paper does descriptive statistics.

The data used in this study are derived from the CHFS2017 household financial survey data. Following data processing, the final study sample consists of 127,012 observations. To begin, this paper conducts descriptive statistics analysis to provide an overview of the dataset. As shown in Table 2, the mean value of the financial asset ratio variable FinAssetR is 0.146, the minimum value is − 0.077, the maximum value is 1.915, and the standard deviation is 0.202.   In Figure 1, this paper shows the distribution of FinAssetR, and it can be seen that FinAssetR has a thick tail effect.

In addition, the mean value of the proportion of stock assets (StockMktR) is 0.061, the minimum value is 0, the maximum value is 0.96, and the standard deviation is 0.093.   The mean value of mobile payment ratio (payMobileRatio) is 3.026, the minimum value is 1, the maximum value is 5, and the standard deviation is 1.416.

Table 2. Describes the statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
StockFlag	126627	1.92	0.272	1	2
StockMktR	5693	0.061	0.093	0	0.96
FinAssetR	126971	0.146	0.202	-0.077	1.915
payComputer	127012	0.117	0.322	0	1
payMobileRatio	6155	3.026	1.416	1	5
age	126965	42.712	22.043	0	117
gender	127004	1.495	0.5	1	2
edu	109064	3.476	1.788	1	9

3.4   Analysis of Empirical Results

As shown in columns (1), (2), and (3) in Table 3, the regression coefficients of payComputer are 0.0376,0.0409, and 0.0282, respectively, when regression is performed separately and control variables are added, all of which are significant at the 1% level.   This shows that computer payment promotes the proportion of household allocation of financial assets. The regression coefficients corresponding to age were 0.0004 and 0.0009, respectively, which were significant at the 1% level. The regression coefficient corresponding to edu is 0.013, which is significant at the 1% level.   This shows that the level of education may enhance the family 's awareness of financial risks and promote their allocation ratio. As shown in columns (1), (2) and (3) of Table 4, the regression coefficients of payMobileRatio are 0.00646,0.00696, and 0.00442, respectively, in the regression of individual and control variables, which are significant at the 1% level. This shows that the proportion of mobile payment promotes the proportion of household allocation of financial assets. The regression

coefficients corresponding to age were 0.0004 and 0.0006, respectively, which were significant at the 1% level. The regression coefficient corresponding to edu is 0.00787, which is significant at the 1% level. This shows that the level of education may enhance the family 's awareness of financial risks and promote their allocation ratio.

Table 3. Regression results.

Explanatory variable	（1）	（2）	（3）	（4）	（5）
payComputer	0.0376 ***	0.0409* **	0.0282* **	0.0376 ***	0.0283* **
	(0.00178)	(0.00179)	(0.00201)	(0.00178)	(0.00201)
age		0.000446***	0.000871***		0.000877***
		(2.63e-05)	(3.81e-05)		(3.80e-05)
edu			0.0130* **		0.0130* **
			(0.000387)		(0.000386)
gender			0.00503 ***		0.00500 ***
			(0.00124)		(0.00124)
Constant	0.142* **	0.122** *	0.0508* **	0.142* **	0.0504* **
	(0.000602)	(0.00121)	(0.00328)	(0.000601)	(0.00327)
Observations	126,971	126,924	108,991	126,955	108,977
R-squared	0.004	0.006	0.015	0.004	0.015

The regression was performed using Stata software, and the explained variables were FinAssetR, * * *, * * and *. Corresponding to the 1%, 5% and 10% significance levels, the robust standard deviation is in the brackets.

3.5 Robustness Test

FinAssetR is negative and more than 1 indicates that there is potential deviation and leverage in asset calculation. In order to control the impact of this abnormal value, this paper deletes the data that FinAssetR is not in the range [0,1], and carries out the same regression analysis in Table 3. The results are shown in columns (4) and (5) in Table 3 and Table 4. As shown in Table 3, the regression coefficients for payComputer in the regression alone (4) and in the regression with the addition of the control variables (5) are 0.0376 and 0.0283, respectively, which are both significant at the 1% level. This suggests that even after removing the outliers payComputer also contributes to the proportion of households allocated to financial assets. Similarly, as shown in Table 4, the regression coefficients of payMobileRatio in the regression alone (4) and in the regression with the addition of the control variables (5) are 0.00646 and 0.00442, respectively, which are both significant at the 1% level. This suggests that even after removing the outliers mobile payment ratio contributes equally to the proportion of households allocated to financial assets. Hypotheses 1 and 2 are verified.

Table 4. Regression results.

Explanatory variable	（1）	（2）	（3）	（4）	（5）
payMobileRa tio	0.0064 6*** (0.0019 1)	0.00696 *** (0.0019 0)	0.00442 ** (0.0021 6)	0.0064 6*** (0.0019 1)	0.00442 ** (0.0021 6)
age		0.00040 8*** (0.0001 39)	0.00064 7*** (0.0002 08)		0.00064 7*** (0.0002 08)
edu			0.00752		0.00752

			***		***
			(0.0016 7)		(0.0016 7)
gender			-0.0017 5		-0.0017 5
			(0.0059 9)		(0.0059 9)
Constant	0.157***	0.141***	0.109***	0.157***	0.109***
	(0.0062 6)	(0.0079 6)	(0.0168)	(0.0062 6)	(0.0168)
Observations	6,155	6,155	5,024	6,155	5,024
R-squared	0.002	0.003	0.006	0.002	0.006

The regression was performed using Stata software, and the explained variables were FinAssetR, * * *, * * and *. Corresponding to the 1%, 5% and 10% significance levels, the robust standard deviation is in the brackets.

After that, in order to control the impact of the region, this paper grouped regression according to the region Rural (Rural = 1 is rural, 0 is urban), and the results are shown in Table 5 and Table 6.   As shown in the regression results of columns (1) and (3) in Table 5, the regression results of payComputer are 0.0223 and 0.0181, respectively, which are significant at the 1% level. This shows that regardless of whether the control variables are added, the computer payment of urban households can promote the allocation of financial assets.   As shown in the regression results of columns (2) and (4) in Table 5, the regression results of mobile payment ratio (payMobileRatio) are 0.006 and 0.00431, respectively, which are significant at the 1% and 10% levels, respectively. This shows that whether or not to add control variables, the proportion of computer payments and mobile payments in urban households can promote household allocation of financial assets.

Similarly, the results in Table 6 show that the computer payment of urban households can promote the allocation of financial assets regardless of whether the control variables are added.Whether or not the control variables are added, the computer payment of rural households can promote the allocation of financial assets, while the improvement effect of mobile payment is not significant.

Table 5. Regression Rural = 0 based on region.

Explanatory variable	（1）	（2）	（3）	（4）
	Rural=0			
payComputer	0.0223***		0.0181***	
	(0.00200)		(0.00223)	
age			0.000705***	0.000625***
			(5.11e-05)	(0.000232)
edu			0.0103***	0.00815**
			(0.000483)	(0.00186)
gender			0.00310*	-0.00214
			(0.00165)	(0.00668)
payMobileRatio		0.00600***		0.00431*
		(0.00215)		(0.00242)
Constant	0.159***	0.158***	0.0838***	0.107***
	(0.000828)	(0.00727)	(0.00448)	(0.0194)
Observations	81,906	4,967	70,776	4,062
R-squared	0.001	0.002	0.008	0.006

The regression was performed using Stata software, and the explained variables were FinAssetR, * * *, * * and *. Corresponding to the 1%, 5% and 10% significance levels, the robust standard deviation is in the brackets.

Table 6. Regression Rural = 1 based on region.

Explanatory variable	（1）	（2）	（3）	（4）
	Rural=1			
payComputer	0.0506***		0.0502***	

	(1)	(2)	(3)	(4)
	(0.00437)		(0.00486)	
age			0.000787***	0.000802
			(5.54e-05)	(0.000511)
edu			0.00895***	0.00734
			(0.000742)	(0.00482)
gender			0.00376**	0.000855
			(0.00177)	(0.0136)
payMobileRatio		0.00836*		0.00712
		(0.00442)		(0.00507)
Constant	0.114***	0.152***	0.0484***	0.0994**
	(0.000810)	(0.0125)	(0.00500)	(0.0393)
Observations	45,049	1,188	38,201	962
R-squared	0.004	0.003	0.010	0.006

The regression was performed using Stata software, and the explained variables were FinAssetR, * * *, * * and *. Corresponding to the 1%, 5% and 10% significance levels, the robust standard deviation is in the brackets.

This paper also groups regressions from a gender perspective, replacing the explanatory variable with the stock asset share (StockMktR), with consistent results. Space constraints prevent a separate presentation.

4   Conclusion

The mean value of the financial asset ratio variable (FinAssetR) is 0.146. Regardless of the inclusion of control variables, the regression coefficient for the proportion of financial assets is significantly positive, indicating that the use of computers increases the allocation of household assets to various financial instruments. Similarly, the regression coefficient for the proportion of mobile payment is significantly positive, suggesting that an increased reliance on mobile payment methods leads to a higher allocation of household assets to financial instruments. The overall model interpretation is enhanced when control variables are included.

To ensure the healthy and stable development of internet finance, the government can take several initiatives. Firstly, there should be a focus on continuously optimizing internet infrastructure, accelerating the transition from home internet to mobile internet, and embracing technologies such as the Internet of Things. Secondly, leveraging the power of existing internet-based information channels, families should be guided in accessing market resources through internet usage. Additionally, through the internet, knowledge about relevant investment and financing markets should be disseminated, promoting financial literacy and fostering family participation in the market, as well as enhancing risk perception. Finally, robust supervision of internet information is necessary to improve the security of online financial market resource utilization, while also utilizing internet information to guide households in making sound investment decisions.

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